

Note on the Isopod Known as *Geoligia Perkinsi* Dollfus  
(Crust.).

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(Presented at the meeting of October 6, 1921.)

In the Fauna Hawaiiensis, Vol. 2, p. 525, Monsieur A. Dollfus described, under the name of *Geoligia perkinsi*, a terrestrial Isopod which had been collected at several localities in the islands of Hawaii and Kauai at heights varying from two to four thousand feet above sea level. The genus *Geoligia*, to which he referred the species, had been established by him in the year 1893\* for a species found at a height of 1200 metres in the forests at Cumbre de Valencia, Venezuela. He defined the new genus as follows:

"Coxopodites (épimères des auteurs) non distincts. Le reste comme dans le genre *Ligia*. Espèces terrestres."

The new species from Hawaii, which is described in some detail, gave Dollfus an opportunity to revise the characters of the genus, and he points out that the line of separation between the epimera and the segments exists on the segments posterior to the first, but is scarcely distinct. To the generic characters, however, he adds that the branches of the uropods are articulated. Consequently, he redefined the genus as follows:

"Coxopodites (épimères) non ou très-peu distincts. Appendices des uropodes articulés. Le reste, et notamment les parties buccales, comme dans le genre *Ligia*. Espèces terrestres."

The species *Geoligia perkinsi* is described at some length, and it is stated that the pleo-telson has the posterior margin provided with five blunt teeth similar to that of *Ligia exotica* Roux.

Some years ago some terrestrial Isopoda were sent to me from Honolulu and Puuloa in the Hawaiian Islands by the late G. W. Kirkaldy as *Geoligia perkinsi*. On examination, however, they proved definitely to be examples of *Ligia exotica*

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Proc. Haw. Ent. Soc., V, No. 1, October, 1922.

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\* Voyage de M. E. Simon au Venezuela; Isopodes terrestres, Ann. Soc. Entomol. de France, vol. LXII, p. 343.

Roux, a species which is stated by Miss Richardson<sup>†</sup> to occur at "Honolulu, Hawaii." I have dealt fully with this species in my report on the Isopoda from the shore of Chilka Lake, India (Memoirs Indian Museum, Vol. V, p. 462), and in it have pointed out that in the male the epimera are completely united with the segments in all segments, the junction being indicated only by a faint line, but that in the adult females a suture is fairly distinct on segments 2, 3 and 4, and that there appears to be much variation in the distinctness of the epimera in different species of *Ligia*. It is clear, therefore, that this character alone is not sufficient for the establishment of the genus *Geoligia*, as has been admitted by Dollfus himself in the revised diagnosis. There remains, therefore, only the articulations of the branches of the uropods. This character is, as Dollfus states, very remarkable, and I have been anxious, therefore, to get specimens showing it. These I have so far failed to obtain. While in Honolulu, in 1920, I collected some specimens of *Ligia* on the edge of a fresh-water swamp at Honolulu, but these proved to be *Ligia exotica*. From the Bishop Museum, by the kindness of Mr. O. H. Swezey, I got also some specimens labeled "S. E. Koolau Mts., Oahu," collected by J. C. Bridwell. These also proved to be undoubtedly *Ligia exotica*, having the branches of the uropods non-articulated. The height at which these specimens at Koolau mountains were obtained is not stated. Subsequently, Mr. Swezey has sent me other specimens from two places at Waialae, one at a sand bank on the edge of a spring near the seashore, and the other at the edge of a fresh-water lagoon near the seashore. All of these prove to be *Ligia exotica*.

From the great resemblance of *Geoligia perkinsi* in most characters to *Ligia exotica*, and from the fact that I have been unable to obtain any specimens from the Hawaiian Islands with the rami of the uropods articulated, I am inclined to believe that there must be some mistake about this character. In the list of localities and specimens from which *Geoligia perkinsi* were obtained, M. Dollfus mentions only one male with a complete uropod, and Mr. Swezey tells me that there are

<sup>†</sup> Monograph of Isopods of North America, p. 676.

at present no specimens of *Geoligia perkinsi* in the Bishop Museum with uropoda attached.

If this character is based on a single specimen, as appears to be the case, it seems probable that the articulation of the branch of the uropods was either abnormal or perhaps that the appearance was caused by the very slender rami having been bent at certain points. This is easily possible, and has actually occurred in at least two of my specimens, giving an appearance somewhat like articulations. Dollfus, however, definitely states that the exopod is three-jointed and the endopod six-jointed, and this is shown in his figure. The shape of the terminal segment is, as he says, similar to that of *Ligia exotica*, and the other drawings of the head, antennae, lower lip and mandibles, maxillae and maxillipeds correspond precisely with those of *Ligia exotica*. *Ligia exotica* is primarily a species of the seashore, but it is known to occur on the edges of fresh-water streams and lagoons at considerable distances from the shore, and there seems to be no reason why it may not reach as high as the localities given for *Geoligia perkinsi*. To test the truth of my suggestion that *Geoligia perkinsi* is the same as *Ligia exotica*, I wish, of course, to get specimens from the same localities as those given for *Geoligia perkinsi*, and I shall be greatly obliged to any naturalist who can assist me in doing so. The specimens at present at my disposal are not sufficient to show to what height *Ligia exotica* extends, but it certainly does live in the Hawaiian Islands on the edge of fresh-water springs and lagoons, as shown by the specimens that I have mentioned above, and presumably those from the S. E. Koolau mountains must have been obtained at some considerable height above the sea level.

The tube labeled "*Geoligia perkinsi*, Puuloa,"<sup>‡</sup> which was sent to me by the late G. W. Kirkaldy in 1908, contains seven specimens of which two still have the uropoda complete. These are non-articulate, and the specimens are undoubtedly *Ligia exotica*, quite similar to the other specimens from on and near the seashore.

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<sup>‡</sup> The place where these specimens were collected is near the mouth of the channel from Pearl Harbor, Oahu.

In the type species of the genus, *Geoligia simoni* from Venezuela, only the outer branch of the uropod was present, and it is non-articulate. The articulation of the branches of the uropods in *G. perkinsi*, if it really occurs, would, as far as I know, be the only instance in the family and should be supported by stronger evidence than that at present existing, for this appears to be based on a single specimen in which the uropods had possibly been injured.

Addenda: From the facts given above I was quite convinced that *Geoligia perkinsi* Dollfus was identical with *Ligia exotica* Roux, but for complete confirmation of this conclusion it was necessary to prove that *L. exotica* extends to heights above sea level comparable to those recorded for *Geoligia perkinsi*. Through the kindness of Mr. O. H. Swezey this proof is now supplied. I have just received two specimens collected by him at the base of leaves of *Astelia* plants at "Summit Camp," Kauai, at an altitude of 2000 feet. These two specimens are quite the same as those found near the seashore and are certainly *Ligia exotica*. The uropoda are detached from the body, but fortunately two complete uropoda are in the tube and these have the branches uniarticulate and agreeing closely with the description I have given for the Lake Chilka specimens of *Ligia exotica*. Mr. Swezey has also sent me two other specimens from Kauai collected by Mr. J. A. Kusehe at an altitude of 4000 feet. These prove to be also *Ligia exotica*, fortunately having two uropods present with the uniarticulate branches usual in that and other species and showing no sign of the articulation described for *Geoligia perkinsi*. These specimens show that *Ligia exotica* occurs as a terrestrial species in the Hawaiian Islands up to an altitude of 4000 feet and confirm my conclusion that *Geoligia perkinsi* is the same species and that the articulation of the branches of the uropods described by Dollfus was based on a damaged specimen. Moreover, this is not the only case where a species of *Ligia* commonly found on or near the seashore extends to considerable altitudes, for in Lord Howe Island *Ligia australiensis*, which is common on the seashore in the eastern parts of Australia, occurs in fresh waters up to a height of 700 feet. Similarly in the Juan Fernandez Islands the shore amphipod *Orchestia chiliensis* is also found at altitudes of 1500 feet; in the Hawaiian Islands *Orchestia platensis* is found from the seashore up to very considerable heights, and numerous other examples of the same kind could be given.

(Dr. Charles Chilton, Canterbury College, June 20, 1922.)